

CLAIMS

1. A method of screening a compound or element or a salt thereof that changes the binding property or signal transduction of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, to an ionizable metal element or a salt thereof, which comprises using (1) said receptor protein, its partial peptide, or a salt thereof and (2) said metal element or a salt thereof.

2. The screening method according to claim 1, wherein said G protein-coupled receptor protein is a G protein-coupled receptor protein consisting of the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 6 or SEQ ID NO: 8.

3. A kit for screening a compound or element or a salt thereof that changes the binding property or signal transduction of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, to an ionizable metal element or a salt thereof, which comprises (1) said receptor protein, its partial peptide, or a salt thereof and (2) said metal element or a salt thereof.

4. A pharmaceutical, which comprises a compound or element or a salt thereof that changes the binding property or signal transduction of an ionizable metal element or a salt thereof to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof.

5. A prophylactic/therapeutic agent for, wounds, burn, declining of learning ability, hypogonadism, dysgeusia, anosmia, hyperplasia, arteriosclerosis, myocardial infarction, apoplexy, cirrhosis, cholesterol accumulation, cancer, diabetes mellitus, respiratory disturbances, indigestion, cardiac disturbances or hypothyroidism, which comprises an agonist for a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof.

6. A prophylactic/therapeutic agent for hypotonic bladder induced by sensory decrease of the bladder or hypotonic bladder induced by postsurgical bladder anesthesia of the pelvic organs, which comprises an agonist for a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof.

7. A prophylactic/therapeutic agent for renal dysfunction, pulmonary dysfunction or sensory neuropathy, which comprises an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof.

8. A prophylactic/therapeutic agent for overactive bladder-induced pollakiuria, nocturia, cystitis-induced pollakiuria, prostatic hyperplasia-induced pollakiuria, urinary incontinence, urinary urgency, pelvic visceral pain, coital pain, bladder irritation symptoms or various disorders caused by urinary calculus, which comprises an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof.

9. A method of screening an agonist for a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, which comprises assaying an intracellular Ca^{2+} level increasing activity when a test compound or element or a salt thereof is brought in contact with a cell containing said receptor protein.

10. A method of screening an agonist for or an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, which comprises using (1) said receptor protein or its partial peptide, or a salt thereof and (2) a compound or element or a salt thereof that changes the binding property of said receptor protein or a salt thereof to an ionizable metal element or a salt thereof.

11. A kit for screening an agonist for or an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, which comprises (1) said receptor protein or its partial peptide, or a salt thereof and (2) a compound or element or a salt thereof that changes the binding property of said receptor protein or a salt thereof to an ionizable metal element or a salt thereof.

12. A prophylactic/therapeutic agent for wounds, burn, declining of learning ability, hypogonadism, dysgeusia, anosmia, hyperplasia, arteriosclerosis, myocardial infarction, apoplexy, cirrhosis, cholesterol accumulation, cancer, diabetes mellitus, respiratory disturbances, indigestion, cardiac disturbances or hypothyroidism, which comprises a G protein-coupled receptor protein comprising the same or substantially

the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, or a salt thereof.

13. A prophylactic/therapeutic agent for hypotonic bladder induced by sensory decrease of the bladder or hypotonic bladder induced by postsurgical bladder anesthesia of the pelvic organs, which comprises a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, or a salt thereof.

14. A prophylactic/therapeutic agent for, wounds, burn, declining of learning ability, hypogonadism, dysgeusia, anosmia, hyperplasia, arteriosclerosis, myocardial infarction, apoplexy, cirrhosis, cholesterol accumulation, cancer, diabetes mellitus, respiratory disturbances, indigestion, cardiac disturbances or hypothyroidism, which comprises a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

15. A prophylactic/therapeutic agent for hypotonic bladder induced by sensory decrease of the bladder or hypotonic bladder induced by postsurgical bladder anesthesia of the pelvic organs, which comprises a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

16. A diagnostic agent for wounds, burn, declining of learning ability, hypogonadism, dysgeusia, anosmia, hyperplasia, arteriosclerosis, myocardial infarction, apoplexy, cirrhosis, cholesterol accumulation, cancer, diabetes mellitus, respiratory disturbances, indigestion, cardiac disturbances, hypothyroidism, renal dysfunction, pulmonary dysfunction or sensory neuropathy, which comprises a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

17. A diagnostic agent for hypotonic bladder induced by sensory decrease of the bladder, hypotonic bladder induced by postsurgical bladder anesthesia of the pelvic organs, overactive bladder-induced pollakiuria, nocturia, cystitis-induced pollakiuria, prostatic hyperplasia-induced pollakiuria, urinary incontinence, urinary urgency, pelvic visceral pain, coital pain, bladder irritation symptoms or various

disorders caused by urinary calculus, which comprises a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

18. A prophylactic/therapeutic agent for renal dysfunction, pulmonary dysfunction or sensory neuropathy, which comprises an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, or a salt thereof.

19. A prophylactic/therapeutic agent for overactive bladder-induced pollakiuria, nocturia, cystitis-induced pollakiuria, prostatic hyperplasia-induced pollakiuria, urinary incontinence, urinary urgency, pelvic visceral pain, coital pain, bladder irritation symptoms or various disorders caused by urinary calculus, which comprises an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, or a salt thereof.

20. A diagnostic agent for wounds, burn, declining of learning ability, hypogonadism, dysgeusia, anosmia, hyperplasia, arteriosclerosis, myocardial infarction, apoplexy, cirrhosis, cholesterol accumulation, cancer, diabetes mellitus, respiratory disturbances, indigestion, cardiac disturbances, hypothyroidism, renal dysfunction, pulmonary dysfunction or sensory neuropathy, which comprises an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, or a salt thereof.

21. A diagnostic agent for hypotonic bladder induced by sensory decrease of the bladder, hypotonic bladder induced by postsurgical bladder anesthesia of the pelvic organs, overactive bladder-induced pollakiuria, nocturia, cystitis-induced pollakiuria, prostatic hyperplasia-induced pollakiuria, urinary incontinence, urinary urgency, pelvic visceral pain, coital pain, bladder irritation symptoms or various disorders caused by urinary calculus, which comprises an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, or a salt thereof.

22. A prophylactic/therapeutic agent for renal dysfunction, pulmonary dysfunction or sensory neuropathy, which comprises a polynucleotide containing the

entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

23. A prophylactic/therapeutic agent for overactive bladder-induced pollakiuria, nocturia, cystitis-induced pollakiuria, prostatic hyperplasia-induced pollakiuria, urinary incontinence, urinary urgency, pelvic visceral pain, coital pain, bladder irritation symptoms or various disorders caused by urinary calculus, which comprises a polynucleotide containing the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

24. A method of screening a compound or its salt that changes the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1 to prevent/treat wounds, burn, declining of learning ability, hypogonadism, dysgeusia, anosmia, hyperplasia, arteriosclerosis, myocardial infarction, apoplexy, cirrhosis, cholesterol accumulation, cancer, diabetes mellitus, respiratory disturbances, indigestion, cardiac disturbances, hypothyroidism, renal dysfunction, pulmonary dysfunction or sensory neuropathy, which comprises using a polynucleotide comprising a polynucleotide encoding said receptor protein or its partial peptide.

25. A method of screening a compound or a salt thereof that changes the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, to prevent/treat hypotonic bladder induced by sensory decrease of the bladder, hypotonic bladder induced by postsurgical bladder anesthesia of the pelvic organs, overactive bladder-induced pollakiuria, nocturia, cystitis-induced pollakiuria, prostatic hyperplasia-induced pollakiuria, urinary incontinence, urinary urgency, pelvic visceral pain, coital pain, bladder irritation symptoms or various disorders caused by urinary calculus, which comprises using a polynucleotide comprising a polynucleotide encoding said receptor protein or its partial peptide.

26. A kit for screening a compound or its salt that changes the expression level of a G protein-coupled receptor protein comprising the same or substantially

the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1 to prevent/treat wounds, burn, declining of learning ability, hypogonadism, dysgeusia, anosmia, hyperplasia, arteriosclerosis, myocardial infarction, apoplexy, cirrhosis, cholesterol accumulation, cancer, diabetes mellitus, respiratory disturbances, indigestion, cardiac disturbances, hypothyroidism, renal dysfunction, pulmonary dysfunction or sensory neuropathy, which comprises a polynucleotide comprising a polynucleotide encoding said receptor protein or its partial peptide.

27. A kit for screening a compound or a salt thereof that changes the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, to prevent/treat hypotonic bladder induced by sensory decrease of the bladder, hypotonic bladder induced by postsurgical bladder anesthesia of the pelvic organs, overactive bladder-induced pollakiuria, nocturia, cystitis-induced pollakiuria, prostatic hyperplasia-induced pollakiuria, urinary incontinence, urinary urgency, pelvic visceral pain, coital pain, bladder irritation symptoms or various disorders caused by urinary calculus, which comprises a polynucleotide comprising a polynucleotide encoding said receptor protein or its partial peptide.

28. A prophylactic/therapeutic agent for wounds, burn, declining of learning ability, hypogonadism, dysgeusia, anosmia, hyperplasia, arteriosclerosis, myocardial infarction, apoplexy, cirrhosis, cholesterol accumulation, cancer, hard labor, diabetes mellitus, respiratory disturbances, indigestion, cardiac disturbances or hypothyroidism, which comprises a compound or its salt that increases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

29. A prophylactic/therapeutic agent for hypotonic bladder induced by sensory decrease of the bladder or hypotonic bladder induced by postsurgical bladder anesthesia of the pelvic organs, which comprises a compound or its salt that increases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

30. A prophylactic/therapeutic agent for renal dysfunction, pulmonary dysfunction or sensory neuropathy, which comprises a compound or its salt that decreases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence

represented by SEQ ID NO: 1, or its partial peptide.

31. A prophylactic/therapeutic agent for overactive bladder-induced pollakiuria, nocturia, cystitis-induced pollakiuria, prostatic hyperplasia-induced pollakiuria, urinary incontinence, urinary urgency, pelvic visceral pain, coital pain, bladder irritation symptoms or various disorders caused by urinary calculus, which comprises a compound or its salt that decreases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

32. A method of preventing/treating wounds, burn, declining of learning ability, hypogonadism, dysgeusia, anosmia, hyperplasia, arteriosclerosis, myocardial infarction, apoplexy, cirrhosis, cholesterol accumulation, cancer, diabetes mellitus, respiratory disturbances, indigestion, cardiac disturbances or hypothyroidism, which comprises administering to a mammal an effective dose of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, (iii) an agonist for a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, or (iv) a compound or its salt that increases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

33. A method of preventing/treating hypotonic bladder induced by sensory decrease of the bladder or hypotonic bladder induced by postsurgical bladder anesthesia of the pelvic organs, which comprises administering to a mammal an effective dose of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, (iii) an agonist for a G protein-coupled receptor protein comprising the same or substantially the same

amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, or (iv) a compound or its salt that increases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

34. A method of preventing/treating renal dysfunction, pulmonary dysfunction or sensory neuropathy, which comprises administering to a mammal an effective dose of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, or (iv) a compound or its salt that decreases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

35. A method of preventing/treating overactive bladder-induced pollakiuria, nocturia, cystitis-induced pollakiuria, prostatic hyperplasia-induced pollakiuria, urinary incontinence, urinary urgency, pelvic visceral pain, coital pain, bladder irritation symptoms or various disorders caused by urinary calculus, which comprises administering to a mammal an effective dose of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, or (iv) a compound or its salt that decreases the expression level of a G protein-coupled

receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide.

36. Use of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, (iii) an agonist for a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, or (iv) a compound or its salt that increases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, to manufacture A prophylactic/therapeutic agent for wounds, burn, declining of learning ability, hypogonadism, dysgeusia, anosmia, hyperplasia, arteriosclerosis, myocardial infarction, apoplexy, cirrhosis, cholesterol accumulation, cancer, diabetes mellitus, respiratory disturbances, indigestion, cardiac disturbances or hypothyroidism.

37. Use of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, (iii) an agonist for a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, or (iv) a compound or its salt that increases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, to manufacture a prophylactic/therapeutic agent for hypotonic bladder induced by sensory decrease of the bladder or hypotonic bladder induced by postsurgical bladder anesthesia of the pelvic organs.

38. Use of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, its partial peptide, or a salt thereof, (ii) a

polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, or (iv) a compound or its salt that decreases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, to manufacture a prophylactic/therapeutic agent for renal dysfunction, pulmonary dysfunction or sensory neuropathy.

39. Use of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or a salt thereof, or (iv) a compound or its salt that decreases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, or its partial peptide, to manufacture a prophylactic/therapeutic agent for overactive bladder-induced pollakiuria, nocturia, cystitis-induced pollakiuria, prostatic hyperplasia-induced pollakiuria, urinary incontinence, urinary urgency, pelvic visceral pain, coital pain, bladder irritation symptoms or various disorders caused by urinary calculus.